

## PERFUSION APPARATUS AND METHODS FOR PHARMACEUTICAL DELIVERY

### Abstract of the Invention

The present invention provides methods and devices for the delivery of gene therapy pharmaceuticals to a mammalian organ in situ, in vivo, ex vivo, or in vitro. In particular, the methods and devices relate to contacting a mammalian organ viral vector with a gene therapy pharmaceutical in a re-circulating, oxygenated perfusate solution for a sufficient time to provide an effective delivery of the gene therapy pharmaceutical to the target tissue.

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